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EPA Superfund
Record of Decision:

NAVAL WEAPONS STATION EARLE (SITE A)
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COLTS NECK, NJ
09/25/1997

RECORD OF DECISION
OPERABLE UNIT 2 (OU-2)
SITE 19

NAVAL WEAPONS STATION EARLE
Colts Neck, New Jersey

Northern Division
Naval Facilities Engineering Command
Contract No. N62472-90-D-1298
Contract Task Order 279

AUGUST 1997

RECORD OF DECISION
NAVAL WEAPONS STATION EARLE
OPERABLE UNIT 2

TABLE OF CONTENTS

PART I - DECLARATION

I. SITE NAME AND LOCATION
II. STATEMENT OF BASIS AND PURPOSE
III. ASSESSMENT OF THE SITE
IV. DESCRIPTION OF THE SELECTED REMEDY
V. STATUTORY DETERMINATION

PART II - DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION
II. SITE HISTORY AND ENFORCEMENT ACTIVITY
III. HIGHLIGHTS OF COMMUNITY PARTICIPATION
IV. SCOPE AND ROLE OF OPERABLE UNIT 2
V. SUMMARY OF SITE CHARACTERISTICS
VI. SUMMARY OF SITE RISKS
VII. REMEDIAL ACTION OBJECTIVES
VIII. DESCRIPTION OF REMEDIAL ACTION ALTERNATIVES
XI. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES
X. THE SELECTED REMEDY
XI. STATUTORY DETERMINATIONS
XII. DOCUMENTATION OF SIGNIFICANT CHANGES

PART III - RESPONSIVENESS SUMMARY

I. OVERVIEW
II. BACKGROUND ON COMMUNITY INVOLVEMENT
III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS

LIST OF TABLES

TABLE	DESCRIPTION
1	Site 19 Groundwater
2	Comparison of Site-Related Metals Concentrations to Background Concentrations - Site 19
3	Summary of Estimated RME Cancer Risks and Noncarcinogenic Hazard Indices - Site 19
4	Summary of Central Tendency Cancer Risks and Noncarcinogenic Hazard Indices - Site 19
5	Site 19 - Screening of Remedial Alternatives
6	Site 19 - Comparative Analysis of Remedial Action Alternatives
7	Potential Federal Chemical-Specific ARARs and TBCs
8	Potential State Chemical-Specific ARARs and TBCs
9	Potential Federal Location-Specific ARARs and TBCs
10	Potential State Location-Specific ARARs and TBCs
11	Potential Federal Action-Specific ARARs and TBCs
12	Potential State Action-Specific ARARs and TBCs

LIST OF FIGURES

FIGURE	DESCRIPTION
1	Regional Site Map
2	Mainside Site Locations
3	Site 19 - Paint Chip and Sludge Disopsal Area
4	Groundwater Contour Map - Site 19 (August 7,1995)
5	Groundwater Contour Map - Site 19 (October 17,1995)
6	Concentrations above Screening Levels - Site 19
7	Proposed Areal Extent of Excavation- Site 19

LIST OF APPENDICES

Appendix A	Terms Used in the Record of Decision
Appendix B	Attendance List - April 24, 1997 Public Meeting

RECORD OF DECISION
NAVAL WEAPONS STATION EARLE
OPERABLE UNIT 2 (SITE 19)

PART 1 - DECLARATION

I. SITE NAME AND LOCATION

Naval Weapons Station Earle
Colts Neck, Monmouth County, New Jersey

II. STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the remedial action alternative selected for Operable Unit 2 (OU-2), to address soil and groundwater contamination at the Naval Weapons Station (NWS) Earle Site, located in Colts Neck, New Jersey (Site). OU-2 includes the paint chip and sludge disposal area (Site 19).

This remedial action decision is in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedial action and is based on the Administrative Record for OU-2. Reports and other information used in the remedy selection process are part of the Administrative Record file for OU-2, which is available at the Monmouth County Library, Eastern Branch, Route 35, Shrewsbury, New Jersey.

The New Jersey Department of Environmental Protection (NJDEP) has commented on the selected remedy, and the their comments have been incorporated into this ROD. A review of the public response to the Proposed Plan is included in the Responsiveness Summary (Part III) of the decision document.

III. ASSESSMENT OF THE SITE

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. º 9606, that actual or threatened releases of hazardous substances from OU-2, as discussed in Section VI (Summary of Site Risks) of this ROD, if not addressed by implementing the remedial action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

IV. DESCRIPTION OF THE SELECTED REMEDY

The Department of the Navy (NAVY) and the United States Environmental Protection Agency (EPA), in consultation with NJDEP, have selected the following remedy for OU-2, Site 19. The remedy includes excavation and off-site disposal of contaminated soil and sediments, institutional controls, and long-term groundwater monitoring. The selected remedy for Site 19 includes the following major components:

1. Excavation and off-site disposal of contaminated soils and sediments.

2. Establishment of classification exception area (CEA) immediately adjacent to the former paint chip and sludge disposal area to bar the use of groundwater during the remediation period.

3. Provision of long-term periodic groundwater monitoring.

While the remedial action objective (RAO) for groundwater protection would not be immediately achieved, risks would be reduced in relation to background by the elimination of the contaminant source and continued monitoring to evaluate contaminant trends. Long-term periodic monitoring and analysis would determine when the RAO would be achieved.

V. STATUTORY DETERMINATION

The selected remedy is protective of human health and the environment and is cost effective. The Navy and EPA believe that the selected remedy will comply with all federal and state requirements that are legally applicable or relevant and appropriate to the remedial action. The selected remedy utilizes a permanent solution to the maximum extent practicable.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review by the Navy, EPA, and NJDEP will be conducted within 5 years after initiation of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

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RECORD OF DECISION

NAVAL WEAPONS STATION EARLE

OPERABLE UNIT 2

SITE 19

PART II - DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

NWS Earle is located in Monmouth County, New Jersey, approximately 47 miles south of New York City. The station consists of two areas, the 10,248-acre Main Base (Mainside area), located inland, and the 706-acre Waterfront area (Figure 1). The two areas are connected by a Navy-controlled right-of-way.

The facility was commissioned in 1943, and its primary mission is to supply ammunition to the naval fleet. An estimated 2,500 people either work or live at the NWS Earle station.

The Mainside area is located approximately 10 miles inland from the Atlantic Ocean at Sandy Hook Bay in Colts Neck Township, which has a population of approximately 6,500 people. The surrounding area includes agricultural land, vacant land, and low-density housing. The Mainside area consists of a large, undeveloped portion associated with ordnance operations, production, and storage; this portion is encumbered by explosive safety quantity distance arcs. Other land use in the Mainside area consists of residences, offices, workshops, warehouses, recreational space, open space, and undeveloped land. The Waterfront area is located adjacent to Sandy Hook Bay in Middletown Township, which has a population of approximately 28,200 people. The Mainside and Waterfront areas are connected by a narrow strip of land containing a road and railroad which serves as a government-controlled.

Operable Unit 2 (OU-2) consists of the former paint chip and sludge disposal area (Site 19), located in the Mainside area (Figure 2). Paint chips and sludges from a maintenance area were disposed from the early 1940s until the early 1960s in a topographic depression near Building S-34 (Figure 3). Paint slurries and solvent residues were also discharged into an open drainage swale. The site is a 300-foot circular area; half is paved with asphalt and half is covered by gravel. The depression is 50 feet in diameter, with a depth ranging from 5 to 10 feet. The drainage swale runs from the depression to a small stream in the wetlands adjacent to the site. The paved portion of the site is currently used to train Navy forklift operators.

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II. SITE HISTORY AND ENFORCEMENT ACTIVITY

Potential hazardous substance releases at NWS Earle were addressed in an Initial Assessment Study (IAS) in 1982, a Site Inspection Study (SI) in 1986, and a Phase I Remedial Investigation (RI) in 1993. These were preliminary investigations to determine the number of sources, compile histories of waste-handling and disposal practices at the sites, and acquire data on the types of contaminants present and potential human health and/or environmental receptors. The Phase I RI at Site 19 included the installation and sampling of monitoring wells and collection of surface water and sediment samples.

In 1990, NWS Earle was placed on the National Priorities List (NPL), which is a list of sites where uncontrolled hazardous substance releases may potentially present serious threats to human health and the environment. The sites at NWS Earle were subsequently addressed by Phase II RI activities to determine the nature and extent of contamination at these sites. Activities included installation and sampling of groundwater monitoring wells, surface water and sediment sampling, and surface and subsurface soil sampling. The Phase II RI was initiated in 1995 and completed in July 1996, when the final RI report was

released. The results of the RI were used as the basis for performing a feasibility study (FS) of potential remedial alternatives. The Navy and EPA, in consultation with NJDEP, developed the Proposed Remedial Action Plan (Proposed Plan). The Proposed Plan is the basis for the selected remedial alternative presented in the ROD and is based on the alterative development from the FS. The RI, FS, Proposed Plan and community input are discussed in this ROD.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

The documents that the Navy and EPA used to develop, evaluate, and select a remedial alternative for OU-2

have been maintained at the Monmouth County Library (Eastern Branch), Route 35, Shrewsbury, New Jersey.

The feasibility study report, Proposed Plan, and other documents related to OU-2 were released to the public on March 21, 1997. The notice of availability of these documents was published in the Asbury Park Press on April 18, 20, and 21, 1997. A public comment period was held from March 21, 1997 to April 30, 1997.

A public meeting was held during the public comment period on April 24, 1997. At this meeting, representatives from the Navy and EPA were available to answer questions about OU-2 and the remedial alternatives under consideration. Results of the public comment period are included in the Responsiveness Summary, which is Part III of this ROD.

IV. SCOPE AND ROLE OF RESPONSE ACTION FOR OPERABLE UNIT 2

The Department of the Navy completed an RI, FS and Proposed Plan for OU-2, addressing contamination associated with Site 19 at NWS Earle. These studies had shown that groundwater and soils in the areas of the former paint chip and sludge disposal pit and the drainage ditch leading from it had been contaminated with metals. The final remedial action to address site contamination at Site 19 is described in this document.

V. SUMMARY OF SITE CHARACTERISTICS

A. General

NWS Earle is located in the coastal lowlands of Monmouth County, New Jersey, within the Atlantic Coastal Plain Physiographic Province. The Mainside area, which includes OU-2, lies in the outer Coastal Plain, approximately 10 miles inland from the Atlantic Ocean. The Mainside area is relatively flat, with elevations ranging from approximately 100 to 300 feet above mean sea level (MSL). The most significant topographic relief within the Mainside area is Hominy Hills, a northeast-southwest-trending group of low hills located near the center of the station.

The rivers and streams draining NWS Earle ultimately discharge to the Atlantic Ocean, which is approximately 9 or 10 miles east of the Mainside area. The headwaters and drainage basins of three major Coastal Plain rivers (Swimming, Manasquan, and Shark) originate on the Mainside area. The northern half of the Mainside is in the drainage basin of the Swimming River, and tributaries include Mine Brook,

Hockhockson Brook, and Pine Brook. The southwestern portion of the Mainside drains to the Manasquan River via either Marsh Bog Brook or Mingamahone Brook. The southeastern comer of the Mainside drains to the Shark River. Both the Swimming River and the Shark River supply water to reservoirs used for public water supplies.

NWS Earle is situated in the Coastal Plain Physiographic Province of New Jersey. The New Jersey Coastal Plain is a seaward-dipping wedge of unconsolidated Cretaceous to Quaternary sediments that were deposited on a pre-Cretaceous basement-bedrock complex. The Coastal Plain sediments are primarily composed of clay, silt, sand, and gravel and were deposited in continental, coastal, and marine environments. The sediments generally strike northeast-southwestand dip to the southeast at a rate of 10 to 60 feet per mile. The approximate thickness of these sediments beneath NWS Earle is 900 feet. The pre-Cretaceous complex consists mainly of PreCambrian and lower Paleozoic crystalline rocks and metamorphic schists and gneisses. The

Cretaceous to Miocene Coastal Plain Formations are either exposed at the surface or subcrop in a banded pattern that roughly parallels the shoreline. The outcrop pattern is caused by the erosional truncation of the dipping sedimentary wedge. Where these formations are not exposed, they are covered by essentially flat-lying post-Miocene surficial deposits.

Groundwater classification areas were established in New Jersey under New Jersey Department of Environmental Projection (NJDEP) Water Technical Programs Groundwater Quality Standards in New Jersey Administrative Code (N.J.A.C.) 7:9-6. The Mainside area is located in the Class II-A: Groundwater Supporting Potable Water Supply area. Class II-A includes those areas where groundwater is an existing source of potable water with conventional water supply treatment or is a potential source of potable water. In the Mainside area, in general, the deeper aquifers are used for public water supplies and the shallower aquifers are used for domestic supplies.

OU-2 is situated in the recharge area of the Kirkwood-Cohansey aquifer system. The Kirkwood-Cohansey aquifer system is a source of water in Monmouth County and is composed of the generally unconfined sediments of the Cohansey Sand and Kirkwood Formation. The Kirkwood-Cohansey aquifer system has been reported in previous investigations as being used for residential wells in the Mainside area. Along the coast, this aquifer system is underlain by thick diatomaceous clay beds of the Kirkwood Formation.

All facilities located in the Mainside Administration area are connected to a public water supply (New Jersey American Water Company). Water for the public supply network comes from surface water intakes, reservoirs, and deep wells. No public water supply wells or surface water intakes are located on the NWS Earle facility. A combination of private wells and public water supply from the New Jersey American Water Company serves businesses and residences in areas surrounding the Mainside facilities. There are a number of private wells located within a 1-mile radius of NWS Earle and several within the NWS Earle boundaries. The majority of these wells are used for potable supplies; previous testing for drinking water parameters indicates these wells have not been adversely impacted.

There is a rich diversity of ecological systems and habitats at NWS Earle. Knieskern's beaked-rush (Rynchospora knieskemii), a sedge species on the federal endangered list, has been seen on the station, and some species on the New Jersey endangered list, such as the swamp pink (Helonias bullata), may be present. An osprey has visited Mainside and may nest in another area at NWS Earle. The Mingamahone Brook supports bog turtles downstream of the Mainside area and provides an appropriate habitat for them at the Mainside area.

B. Surface Water Hydrology

Site 19 includes a small drainage ditch that runs from the depression to a stream approximately 500 feet to the southwest. The site is at a higher elevation than the stream. The stream is a tributary of the Mingamahone Brook, and as a result, Site 19 is located within the Mingamahone Brook watershed. Water is present in the drainage depression only after periods of heavy rainfall. The stream southwest of the site is surrounded by wetlands. The wetlands, including the stream, drain to the south. The stream is dammed near the power lines west of the site; this has created a small pond north of the dam.

C. Geology

Regional mapping places Site 19 within the outcrop area of the Kirkwood Formation. The Kirkwood Formation ranges between 60 and 100 feet in thickness. The 1995 soil borings are no more than 25 feet deep. The lithology of the sediments encountered in the on-site soil borings generally agrees with the published descriptions of the Kirkwood and Vincentown Formations. Assuming a portion of the Kirkwood Formation was removed by erosion, it is possible that the soil borings penetrated the underlying Vincentown Formation. In general, the borings encountered brown and yellowish-brown, fine- to medium-grained sand, silty sand, sandy silt, and silt (probably representative of the Kirkwood Formation) and glauconitic, fine- to medium-grained sand (probably representative of the Vincentown Formation). Mainside is located above the up-dip limit of the Piney Point, Shark River, and Manasquan Formations; therefore, the glauconitic sand is interpreted to be part of the Vincentown Formation. Based upon the boring log descripbons, the wells penetrated the Kirkwood

and Vincentown Formations.

D. Hydrogeology

Groundwater in the Kirkwood and Vincentown aquifer beneath the site occurs under unconfined conditions and the formations are interpreted to be hydraulically interconnected. Groundwater contour maps are presented in Figure 4 (August 1995) and Figure 5 (October 1995). The direction of shallow groundwater flow in the aquifer, as indicated by both the August and October 1995 groundwater measurements, is toward the west. There does not appear to be significant seasonal variation in groundwater flow direction.

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E. Nature and Extent of Contamination

1. IAS and SI Results

The IAS did not recommend further investigation at Site 19 because it was believed that impacted soils were removed in the early 1970s; however, the site was still included for further study.

The 1986 SI found elevated metals concentrations in surface soils within the topographic depression and near the beginning of the drainage swale. The maximum concentrations detected were cadmium (31,900 mg/kg), lead (1,560 mg/kg), and chromium (639 mg/kg).

2. Phase I Remedial Investigation

During the Phase I RI, groundwater samples showed metals, and shallow soils (0 to 2 feet) showed low levels of two volatile organic compounds (VOCs), methylene chloride and acetone, and metals. VOC detections were believed to be laboratory contaminants and not actually site related. Lead was found at a concentration of up to 12,600 mg/kg in the upper 2 feet of soil in the surface depression and up to 379 mg/kg in the drainage swale. Cadmium was found at a concentration of up to 33.7 mg/kg in the upper 2 feet of soil in the topographic depression.

3. Phase II Remedial Investigation

The results of the Phase II RI, which was conducted to determine whether contamination in surface soil/sediments had leached to subsurface soils, showed that metal concentrations in deeper subsurface soil samples were not at a level above applicable screening criteria. The absence of site-related VOCs in subsurface soils was also confirmed.

The presence of metals (antimony, arsenic, cadmium, thallium, zinc) in groundwater was confirmed. In general, exceedances of metals compounds of concern were found in MW19-07, which is directly downgradient of the topographic depression. Figure 6 depicts sample locations and concentrations of compounds that exceeded applicable or relevant and appropriate requirements (ARARs) and other guidance to be considered (TBCs). Table 1 summarizes the results of samples taken from groundwater compared to applicable standards. Three compounds slightly exceed the federal standard, and others also exceed state guidelines. Contaminants exceeding groundwater standards included aluminum, antimony, arsenic, cadmium, iron, lead, manganese, and thallium. Contaminants in subsurface soil samples that exceeded standards included antimony, cadmium, hexavalent and total chromium, lead, and zinc. It should be noted that most exceedances were found at one well (MW19-07) directly adjacent to the area of concern.

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TABLE 1

SITE 19 GROUNDWATER

	ARARs and TBCs					Data Exceeding ARARs					
	Maximum Exceedance	Frequency of Exceedance	Maximum Contaminant Level (MCL) (ug/L)	Drinking Water Health Advisory (Lowest Criterion Shown) (1)	NJDEP Groundwater Quality Standard (ug/L)	19GW01 1995 RI 7/24/95	19GW02 1995 RI 7/25/95	19GW04 1995 RI 7/24/95	19GW05 1995 RI 7/25/95	19GW06 1995 RI 7/25/95	19GW07 1995 RI 8/11/95
INORGANICS (UG/L)											
ALUMINUM	9610	6/6	-	-	200	3890	1690 J	1210	9610 J	360 J	7670 J
ANTIMONY	7	1/6	6	3 a	20						7
ARSENIC	27	1/6	50	-	8						27
CADMIUM	8	1/6	5	5 e	4						8
IRON	4880	6/6	-	-	300	1980	3200	4880	794	950	3040
LEAD	17	1/6	1.5	-	10						17
MANGANESE	185	2/6	-	-	50				185	56	
THALLIUM	29	1/6	2	0.4 a	10						29 J

1. A Health Advisory is a concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to specified period of time (days or years) of exposure with a margin of safety.

J = Value is estimated because the concentration is below the laboratory contract quantitation limit or because of data validation control quality criteria.

a = The listed health advisory criterion, lifetime adult (70 years), is equal to the most stringent of the EPA health advisories for this chemical.

e = The listed health advisory criterion, long-term child (7 years), is equal to the most stringent of the EPA health advisories for this chemical.

Natural background levels of metals in local soils and groundwater were determined during the RI using samples obtained from locations chosen as being isolated from former or present industrial or military operations. In general, background sample locations were hydraulically upgradient or far removed from potential sources of contamination. In order to compare site-related groundwater metals concentrations found in a specific geologic formation to naturally occurring (background) levels found in the similar distinct geological formation, some existing facility monitoring wells used in the calculation of background concentrations were deemed to have been installed in "background" locations (upgradient of RI sites). The Navy, EPA, and NJDEP collaborated in the selection of all background sample locations. The process of background concentration determination and statistical evaluation is presented in section 31 of the RI report.

Table 2 summarizes the range of background metals concentrations found in groundwater versus the range of concentrations found on site.

4. Groundwater Modeling

Computer modeling estimated that Site 19 groundwater metals concentrations would gradually diminish over a long period of time, assuming source removal and control measures would be implemented. The model indicated that metals concentration at the nearest potential discharge point, a stream located approximately 500 feet downgradient (west) of the site, would be well below either the state standard or background levels. The maximum distance from Site 19 where metals concentration in groundwater would remain above applicable regulatory standards or background levels was estimated by the model to be 191 feet. Surface water samples taken from the watershed downgradient of Site 19 currently show no concentration of compounds above background or regulatory standards.

5. Summary of RI Results

In summary, results of investigations at Site 19 indicate that

- Metals contamination at levels above regulatory standards in Site 19 soils appears to be limited to the topographic depression and the drainage swale shallow surface soil and sediment.

- No organic compounds were found in groundwater at levels above regulatory standards.

- Metals are found in groundwater at concentrations slightly above regulatory standards near the downgradientend of the topographic depression.

TABLE 2
COMPARISON OF SITE-RELATED METALS CONCENTRATION IN GROUNDWATER
TO BACKGROUND CONCENTRATIONS - SITE 19
NWS EARLE, COLTS NECK, NEW JERSEY
(Ig/L)

	BACKGROUND		SITE-RELATED		
SUBSTANCE	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTION	AVERAGE CONCENTRATION
ALUMINUM	11/11	287 - 7870	6/6	360 - 9610	4072
ANTIMONY	NOT DETECTED	-	1/6	6.7	2.2
ARSENIC	1/11	5.8	2/6	3.5 - 27.4	6.3
BARIUM	11/11	2.6 - 518	6/6	16.7 - 753	160
BERYLLIUM	4/11	0.21 - 1.6	2/6	0.75 - 1	0.33
CADMIUM	5/11	0.6 - 1.9	6/6	0.73 - 7.5	2.5
CALCIUM	11/11	506 - 17200	6/6	1330 - 17200	7795
CHROMIUM	NOT DETECTED	-	6/6	3.9 - 43.1	22.3
COBALT	6/11	0.7 - 10.1	6/6	0.95 - 15.6	3.9
COPPER	9/11	0.79 - 13.5	3/6	4.8 - 17.5	4.8
IRON	11/11	153 - 7690	6/6	794 - 4880	2474
LEAD	3/11	2.1 - 3	5/6	1.6 - 17.2	4.8
MAGNESIUM	11/11	273 - 27400	6/6	921 - 27400	6352
MANGANESE	11/11	3.3 - 65	6/6	8.1 - 185	54.4
MERCURY	11/11	0.005 - 0.12	6/6	0.007 - 0.12	0.06
NICKEL	10/11	0.81 - 25.5	6/6	4.8 - 25.4	9.4
POTASSIUM	11/11	350 - 3245	6/6	831 - 1540	1105
SELENIUM	1/11	5.3	1/6	27.2	6.4
SILVER	NOT DETECTED	-	1/6	1	0.6
SODIUM	11/11	1850 - 11650	6/6	3640 - 48100	11977
THALLIUM	3/11	4 - 5.1	1/6	28.9	6.3
VANADIUM	10/11	0.69 - 42.25	5/6	2.3 - 15.6	6.4
ZINC	6/9	3.7 -348	4/6	7.6 - 694	205

VI. SUMMARY OF SITE RISKS

As part of the Phase II RI, human health risk assessments and ecological risk assessments were performed at OU-2. A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration. Exposure Assessment estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed. Toxicity Assessment determines the types of adverse health affects associated with chemical exposures, and the relationship between the magnitude of exposure (dose) and severity of adverse effects (response). Risk Characterization summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks and includes a discussion of site-specific uncertainties such as actual receptor pathways, and receptor activity patterns.

The risk associated with elevated concentrations of lead, chromium, and cadmium found in surface soils during the RI Phase I was not included in these calculations because it was assumed these "hot spot" soils would be removed as part of any remedial action.

A. Human Health Risks

The human health risk assessment estimated the potential risks to human health posed by exposure to contaminated groundwater, surface water and sediment, and surface and subsurface soils at the site. To assess these risks, the exposure scenarios listed below were assumed:

- Ingestion of groundwater as a drinking water source.
- Inhalation of contaminants in groundwater (i.e., volatile compounds emitted during showering).
- Dermal exposure to contaminants in groundwater (i.e., showering, hand washing, bathing).
- Dermal contact from contaminated soils.
- Inhalation of contaminants in soil (i.e., fugitive dusts).
- Incidental ingestion of contaminated soils.
- Incidental ingestion of surface water and sediment.
- Dermal contact with contaminated surface water or sediment.

These scenarios were applied to various site use categories, including current industrial use, future industrial use, future lifetime resident and future recreational child.

Potential human health risks were categorized as carcinogenic or noncarcinogenic. A hypothetical carcinogenic risk increase from exposure should ideally fall below a risk range of 1 x 10 -6 (an increase of one case of cancer for one million people exposed) to 1 x 10 -4 (an increase of one case of cancer per 10,000 people exposed).

Noncarcinogenic risks were estimated using Hazard Indices (HI), where an HI exceeding one is considered an unacceptable health risk.

In addition, results were compared to applicable federal and/or state standards such as federal Maximum Contaminant Levels (MCLs) for drinking water, NJDEP Groundwater Quality Standards (GWQS), or other published lists of reference values.

A baseline human health risk assessment was conducted for Site 19. Cancer risks associated with future residential exposure to groundwater in excess of the acceptable target risk range were determined for Site

19. The primary contaminant contributing to this risk was arsenic (via ingestion of groundwater - Table 3).

Noncarcinogenic HIs exceeded 1.0 for the future industrial and future residential exposure scenarios. Thallium and arsenic were the primary contaminants contributing to this risk (also via ingestion of groundwater - Table 4).

B. Ecological Risks

The ecological risk assessment estimated the risk posed to ecological receptors, such as aquatic and terrestrial biota, from contamination at Site 19.

Sampling results indicate that high concentrations of contaminants, primarily metals, have migrated from the site to the drainage ditch that leads to a tributary of Mingamahone Brook and adjacent wetlands. Sediment concentrations of lead, chromium, cadmium, and zinc in the surface depression and drainage ditch are well above ecological screening toxicity values. In addition, although extensive migration of contaminants in groundwater has not occurred, groundwater discharges into the wetlands, thereby providing a potential exposure pathway.

TABLE 3
SUMMARY OF ESTIMATED RME CANCER RISKS AND NONCARCINOGENIC HAZARD INDICIES - SITE 19
NWS EARLE, COLTS NECK, NEW JERSEY

		Estimated Incremental Cancer Risk				Estimated Hazard Index ***				
		Current	Future	Future	Future	Current	Future	Future		Future
	Exposure	Industrial	Industrial	Lifetime	Recreational	Industrial	Industrial	Resident		Recreational
Medium	Routes	Employee	Employee	Resident	Child	Employee	Employee	Child	Adult	Child
Surface Soil	Incidental Ingestion	N/S	N/A	N/S	N/A	N/S	N/A	N/S	N/A	N/A
	Dermal Contact	N/S	N/A	N/S	N/A	N/S	N/A	N/S	N/A	N/A
	Inhalation of Fugitive Dust	N/S	N/A	N/S	N/A	N/S	N/A	N/S	N/A	N/A
Subsurface Soil	Incidental Ingestion	N/A	1.3E-05	5.7E-05^	N/A	N/A	6.2E-02	8.0E-01^	N/A	N/A
	Dermal Contact	N/A	1.3E-05	4.2E-05^	N/A	N/A	4.2E-01	7.4E-02^	N/A	N/A
	Inhalation of Fugitive Dust	N/A	3.5E-08	2.2E-08^	N/A	N/A	7.7E-03	8.1E-03^	N/A	N/A
Sediment	Incidental Ingestion	N/A	N/A	N/A	5.5E-07	N/A	N/A	N/A	N/A	4.8E-02
	Dermal Contact	N/A	N/A	N/A	3.2E-07	N/A	N/A	N/A	N/A	5.6E-02
Groundwater	Ingestion	N/A	7.8E-05^	3.3E-04^	N/A	N/A	4.1E + 00@	2.7E + 01@	N/A	N/A
	Dermal Contact	N/A	3.3E-08^	7.8E-07^	N/A	N/A	3.2E-02^	1.0E + 00@	N/A	N/A
	Inhalation of Volatiles*	N/A	N/A	N/A**	N/A	N/A	N/A	N/A	N/A**	N/A
Surface Water	Incidental Ingestion	N/A	N/A	N/A	7.2E-09	N/A	N/A	N/A	N/A	5.4E-04
	Dermal Contact	N/A	N/A	N/A	3.3E-08	N/A	N/A	N/A	N/A	4.7E-04
	TOTAL	-	1.0E-04	4.3E-04	9.1E-07	-	4.6E + 00	2.9E + 01	-	1.1E-01

N/A = Not applicable because this media is not associated with this potential receptor
N/S = Not sampled
* = During Showering, Adult Residents Only
* * = No volatiles were detected in groundwater
* * * = Hazard Indicies (i.e., summation of hazard quotients) are used only for comparison purposes and do not reflect actual additive noncarcinogenic effects
^ - Value from amended risk assessment.
@ - Result is the maximum of the His among the affected target organs from the amended risk assessment.

TABLE 4

SUMMARY OF CENTRAL TENDENCY CANCER RISKS AND NONCARCINOGENIC HAZARD INDICIES - SITE 19
NWS EARLE, COLTS NECK, NEW JERSEY

		Estimated Incremental Cancer Risk				Estimated Hazard Index ***				
		Current	Future	Future	Future	Current	Future	Future		Future
Medium	Exposure Routes	Industrial Employee	Industrial Employee	Lifetime Resident	Recreational Child	Industrial Employee	Industrial Employee	Resident Child	Resident Adult	Recreational Child
Surface Soil	Incidental Ingestion	N/S	N/A	N/S	N/A	N/S	N/A	N/S	N/A	N/A
	Dermal Contact	N/S	N/A	N/S	N/A	N/S	N/A	N/S	N/A	N/A
	Inhalation of Fugitive Dust	N/S	N/A	N/S	N/A	N/S	N/A	N/S	N/A	N/A
Subsurface Soil	Incidental Ingestion	N/A	N/R	N/R	N/A	N/A	N/R	N/R	N/A	N/A
	Dermal Contact	N/A	N/R	N/R	N/A	N/A	N/R	N/R	N/A	N/A
	Inhalation of Fugitive Dust	N/A	N/R	N/R	N/A	N/A	N/R	N/R	N/A	N/A
Sediment	Incidental Ingestion	N/A	N/A	N/A	N/R	N/A	N/A	N/A	N/A	N/R
	Dermal Contact	N/A	N/A	N/A	N/R	N/A	N/A	N/A	N/A	N/R
Groundwater	Ingestion	N/A	N/R	4.7E-05^	N/A	N/A	7.8E-01@	3.9E + 00@	N/A	N/A
	Dermal Contact	N/A	N/R	1.0E-07^	N/A	N/A	7.7E-03^	1.8E-01@	N/A	N/A
	Inhalation of Volatiles*	N/A	N/A	N/A**	N/A	N/A	N/A	N/A	N/A**	N/A
Surface Water	Incidental Ingestion	N/A	N/A	N/A	N/R	N/A	N/A	N/A	N/A	N/R
	Dermal Contact	N/A	N/A	N/A	N/R	N/A	N/A	N/A	N/A	N/R
	TOTAL	-	-	4.7E-05	-	-	7.9E-01	4.1E + 00	-	-

N/A = Not applicable because this media is not associated with this potential receptor
N/R - Central Tendency calculation not required
N/S = Not sampled
* = During Showering, Adult Residents Only
* * = No volatiles were detected in groundwater
* * * = Hazard Indicies (i.e., summation of hazard quotients) are used only for comparison purposes and do not reflect actual additive noncarcinogenic effects
^ - Value from amended risk assessment.
@ - Result is the maximum of the His among the affected target organs from the amended risk assessment.

VIII. REMEDIAL ACTION OBJECTIVES(RAOs)

The overall objective for the remedy at Site 19 is to protect human health and the environment. The RAO to protect human health is to prevent human exposure to contaminated soils/sediments and to metal contaminants in groundwater in the area immediately downgradient of the former paint chip and sludge dispose area. The RAOs for protection of the environment are to minimize contaminant migration into groundwater and adjacent wetlands and restoration of the aquifer to the applicable standards.

VIII. DESCRIPTION OF REMEDIAL ACTION ALTERNATIVES

The purpose of the alternative development and screening process is to assemble an appropriate range of possible remedial options to achieve the RAOs identified for the sites. In this process, technically feasible technologies are combined to form remedial alternatives that provide varying levels of risk reduction that comply with federal (EPA) and state (NJDEP) guidelines for site remediation.

Engineering technologies capable of eliminating the unacceptable risks associated with exposure to site-related soils, sediments, or groundwater were identfied, and those alternatives determined to best meet RAOs after screening were evaluated in detail. Table 5 presents the considered alternatives and the results of preliminary screening.

A. Detailed Summary of Alternatives

Summaries of the remedial alternatives developed for OU-2 are presented in the following sections.

1. Alternative 1: No Action

The no-action alternative was developed as a baseline to which other alternatives may be compared, as required by the NCP. No remedial actions would be taken to protect human health or the environment. The purpose of this alternative is to evaluate the overall human health and environmental protection provided by the site in its present state. Periodic reviews of site conditions and long-term monitoring of groundwater, surface water, and sediments would be activities conducted under this alternative.

2. Alternative 2: Limited Action

Alternative 2 was developed as an option that relies on access restrictions and institutional controls to limit exposures to hazardous substances. This alternative does not employ treatment or containment to address site contamination.

TABLE 5
SITE 19 - SCREENING OF REMEDIAL ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

	ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	COST	COMMENTS
1	No Action: (Long-Term Periodic Monitoring, 5-year reviews)	Provides no additional protection of human health or the environment. Does not reduce potential for human exposure to landfill or groundwater contaminants. Does not reduce contaminant migration in the environment. No reduction in toxicity, mobility, or volume of contaminants.	Readily implementable. No technical or administrative difficulties.	Capital: none O&M: low	Retained as baseline alternative in accordance with NCP.
2	Limited Action (institutional controls, access restrictions, long-term periodic monitoring. 5-year reviews)	Provides little added protection of human health through fencing and institutional controls. Groundwater use would be restricted. Does not reduce contaminant migration to the environment No reduction in toxicity, mobility, or volume of contaminants.	Readily implementable. No technical or administrative difficulties.	Capital: none O&M: low	Relative to alternative 1, provides minimal additional protectiveness for additional cost. Eliminated.
3	Capping, Institutional Controls, and Long-Term Periodic Monitoring	Protects human health and the environment. Capping contaminated landfill materials prevent direct contact exposure and minimizes contaminant migration to the environment. Groundwater use would be restricted. Groundwater contaminants will naturally attenuate over time. No reduction of toxicity or volume of contaminants	Readily implementable. No technical or administrative difficulties. Personnel and materials necessary to implement alternative are widely available.	Capital: moderate O&M: moderate	Retained.

TABLE 5
SITE 19 - SCREENING OF REMEDIAL ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	COST		COMMENTS
4 Excavation, On-Site Solidification, On-Site Disposal, and Long-Term Monitoring	Protects human health and the environment by immobilizing soil contaminants, preventing direct contact, and minimizing contaminant migration to the environment. Groundwater use would be restricted. Groundwater contaminants will naturally attenuate over time.	Readily implementable. Specialized treatment equipment is required but is available from several vendors. No technical or administrative difficulties. Personnel and materials necessary to implement alternative are widely available.	Capital: O&M:	moderate moderate	Retained as representative treatment alternative.
5 Excavation and Off-A Base Disposal	Protects human health and the environment by excavating contaminated soils and sediments and transporting them off-base for disposal in a RCRA landfill. Groundwater use would be restricted, Groundwater contaminants will naturally attenuate over time. No reduction of toxicity or volume of contaminants.	Readily implementable. Adequate landfill capacity exists for disposal of the small volume of contaminated materials from Site 19.	Capital: O&M:	low low	Alternative would result in clean closure of Site 19 and would expedite its reuse. Retained.
5 Excavation and On-B Base Disposal	Protects human health and the environment by excavating contaminated soils and sediments and transporting them for consolidation in an existing on-base landfill that is being capped under a separate remedial action. Groundwater use would be restricted. Groundwater contaminants will naturally attenuate over time. No reduction of toxicity or volume of contaminants.	Readily implementable if capping is the selected alternative at the Site 4 landfill. The small volume of contaminated materials from Site 19 would be used to assist in achieving the proper grades for the final cap. The small volume of soils from Site 19 would not be expected to significantly alter the cost or design of the proposed landfill cap.	Capital: O&M:	low low	Alternative would result in clean closure of Site 19 and would expedite its reuse. Retained.

Access restrictions would be attached to the property title and/or the Base Master Plan to limit future uses of the site that may result in increased migration of contaminants or direct contact with contaminated media. A fence would be erected around the contaminant source area soils to prevent access and intrusive activities that could result in further contaminant migration to groundwater and the adjacent wetlands. Long-term, periodic monitoring would be conducted to assess contaminant status and potential threats to human health and the environment. Since wastes would be left in place, site conditions and risks would be reviewed every 5 years.

Because site groundwater does not meet New Jersey groundwater quality standards, a CEA pursuant to N.J.A.C 7:9-6 would be established to provide the state official notice that the constituent standards will not be met for a specified duration and to ensure that use of groundwater in the affected area is suspended until standards are achieved.

3. Alternative 3: Soils Consolidation, Capping, Institutional Controls, and Long-Term Monitoring

Alternative 3 relies on containment and institutional controls to limit exposure to hazardous substances and minimize migration of contaminants to groundwater and the adjacent wetlands. Active treatment is not employed to address site contamination. Contaminants in site groundwater would naturally attenuate over time through dispersion as leaching of contaminants from source soils is reduced.

Contaminated sediments from the drainage ditch would be excavated and consolidated into the topographic depression and the depression would be capped to prevent erosion and minimize migration of contaminants. Access restrictions would be attached to the property title to limit future uses of the site that may result in damage to the cover and increased migration of contaminants. Access restrictions would also prohibit the use of untreated groundwater for drinking water.

Long-term, periodic (beginning as semi-annual) monitoring would be conducted to assess contaminant status and potential threats to human health and the environment. Since wastes would be left in place, site conditions and risks would be reviewed every 5 years.

Because site groundwater does not meet New Jersey groundwater quality standards, a CEA pursuant to N.J.A.C 7:9-6 would be established to provide the state official notice that the constituent standards would not be met for a specified duration and to ensure that use of groundwater in the affected area is suspended until standards are achieved.

4. Alternative 4: Solidification, Institutional Controls, On-Site Disposal, and Long-Term Monitoring

Alternative 4 employs soil treatment to limit exposure to hazardous substances and minimize migration of contaminants to groundwater and the adjacent wetlands. Contaminants in site groundwater would naturally attenuate over time through precipitation, adsorption, dilution, and dispersion after leaching of contaminants from site soils and sediments is abated. Under this alternative, the contaminated sediments and soils from the drainage ditch and the topographic depression (approximately 260 cubic yards, based on the limits of contamination determined by shallow soil borings during the Phase II RI) would be excavated (Figure 7) and treated by solidification to immobilize metals in a stable matrix. Treated soils would be placed in the topographic depression upgradient of the swale. The depression would be backfilled with clean fill, graded level with the surrounding paved surface, and closed with an asphalt cover to form a treated-soil containment cell. Access restrictions would be enacted to limit future uses of the site that may result in intrusion into the treated-soil cell. Access restrictions would also prohibit the use of untreated groundwater for drinking water.

Long-term, periodic monitoring of groundwater, surface water, and sediments would be conducted to assess contaminant status and potential threats to human health and the environment. Site conditions and risks would be reviewed every 5 years since wastes would be left in place.

Because site groundwater does not meet New Jersey GWQS, a CEA pursuant to New Jersey Administrative Code (N.J.A.C) 7:9-6 would be established in the area immediately adjacent and downgradient to well MW19-07 to provide the state official notice that the constituent standards would not be met for a specified duration

and to ensure that use of untreated groundwater in the affected area would be suspended until standards are achieved.

5. Alternative 6: Excavation and Disposal, Institutional Controls, and Long-Term Monitoring

Under Alternative 5, all contaminated soils and sediments (approximately 260 cubic yards) would be excavated (Figure 7) and either sent off base for disposal (Alternative 5A) or consolidated onto Site 4, an on-base, nonhazardous landfill, prior to capping (Alternative 5B). Although only nonhazardous soils would be considered for consolidation onto Site 4 under Alternative 5B; since the estimated volume of soil/sediment known to be contaminated with metals is small and the associated costs for off-site disposal would be correspondingly relatively low, Alternative 5A will be preferred over Alternative 5B. After execution and removal off-site, Site 19 soils would no longer pose threats to groundwater or the adjacent wetlands.

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Once the source of contamination is removed, contaminants in site groundwater would naturally attenuate over time through precipitation, adsorption, dilution, and dispersion. Institutional controls would be enacted to prohibit the use of untreated contaminated groundwater for drinking water until GWQS are met.

Long-term, periodic monitoring of groundwater, surface water, and sediments would be conducted to assess contaminant status and potential threats to human health and the environment. Site conditions and risks would be reviewed every 5 years until standards are met.

Because site groundwater does not meet New Jersey GWQS, a CEA pursuant to N.J.A.C 7:9-6 would be established in the area immediately adjacent to well MW19-07 to provide the state official notice that the constituent standards would not be met for a specified duration and to ensure that use of untreated groundwater in the affected area would be suspended until standards are achieved.

IX. SUMMARY AND COMPARATIVE ANALYSIS OF ALTERNATIVES

The remedial action alternatives described in Section VIII were evaluated using the following criteria, established by the NCP.

Threshold Criteria: Statutory requirements that each alternative must satisfy in order to be eligible for selection.

1. Overall protection of human health and the environment - draws on the assessments conducted under other evaluation criteria and considers how the alternative addresses site risks through treatment, engineering, or institutional controls.

2. Compliance with ARARs - evaluates the ability of an alternative to meet Applicable or Relevant and Appropriate Requirements (ARARs) established through federal and state statutes and/or provides the basis for invoking a waiver.

Primary Balancing Criteria: Technical criteria upon which the detailed analysis is primarily based.

3. Long-term effectiveness and permanence - evaluates the ability of an alternative to provide long term protection of human health and the environment and the magnitude of residual risk posed by untreated wastes or treatment residuals.

4. Reduction of toxicity, mobility or volume through treatment - evaluates an alternative's ability to reduce risks through treatment technology.

5. Short-term effectiveness - addresses the cleanup time frame and any adverse impacts posed by the alternative during the construction and implementation phase, until cleanup goals are achieved.

6. Implementability - is an evaluation of the technical feasibility, administrative feasibility, and availability of services and material required to implement the alternative.

7. Cost - includes an evaluation of capital costs, annual operation and maintenance (O&M) costs.

Modifying Criteria: Criteria considered throughout the development of the preferred remedial alternative and formally assessed after the public comment period, which may modify the preferred alternative.

8. Agency acceptance - indicates the EPA's and the state's response to the alternatives in terms of technical and administrative issues and concerns.

9. Community acceptance - evaluates the issues and concerns the public may have regarding the alternatives.

The remedial alternatives were compared to one another based on the nine selection criteria, to identify differences among the alternatives and discuss how site contaminant threats are addressed.

Based on the initial screening of remedial alternatives, Alternatives 1, 4, and 5 were retained for further consideration. A detailed review of Alternatives is included in this section and summarized in Table 6.

A. Overall Protection of Human Health and the Environment

Alternatives 4 and 5 would be protective of human health and the environment. Because no actions are conducted, Alternative 1 would not reduce human health or ecological risk and would not reduce contaminant migration to the environment.

Alternatives 4 and 5 reduce the potential for direct contact with contaminated materials. By reducing or preventing leaching of contaminants from site soils and sediments, both alternatives minimize contaminant migration into the environment.

By excavating and transporting contaminated materials off site, Alternative 5 results in permanent protection of health and the environment at Site 19. However, because the soils and sediments are not treated, the potential Long-term risks and Long-term monitoring considerations are transferred to another location: to an off base landfill under Alternative 5A and to an on base or off base landfill (for hazardous waste) under Alternative 5B.

In contrast, Alternative 4 incorporates treatment that immobilizes contaminants. The solidification technology has been widely demonstrated and would be expected to provide Long-term protection, but monitoring would be required to ensure the continued effectiveness and permanence of this alternative.

Both Alternatives 4 and 5 include institutional controls that would provide assurance that untreated contaminated groundwater is not used as a potable water source in the future, Alternative 1 would not include any institutional controls to protect future users of site groundwater.

B. Compliance with ARARs

Alternative 1 would not comply with state ARARs for attainment of groundwater quality criteria and would not include a provision to seek a temporary exemption.

Implementation of Alternatives 4 and 5 would comply with all ARARs identified in the FS. Alternatives 4 and 5 would eventually meet GWQC through source removal and natural attenuation and both include a provision to seek a temporary exemption (CEA) from these requirements until the GWQS are achieved.

Compliance with location-specific ARARs would be the same under Alternatives 4 and 5. The potential effects on wetlands, floodplains, water bodies, and other sensitive receptors would be identified during the design of each alternative and all necessary measures would be taken to comply with the federal and state

location-specific ARARs identfied in the FS.

Alternative 4 would be constructed and operated in accordance with federal and state hazardous waste facility regulations if excavated soils and sediments are determined to be hazardous wastes.

Alternative 5 would be conducted in accordance with RCRA hazardous waste generator and transported requirements and New Jersey labeling, records, and transportation requirements if excavated soils and sediments are determined to be hazardous wastes.

Both Alternative 4 and Alternative 5 would be implemented in compliance with RCRA Land Disposal Restricbons (LDRs).

TABLE 6
SITE 19 - COMPARATIVE ANALYSIS OF REMEDIAL ACTION ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

CRITERION:	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 4: EXCAVATION, ON-SITE SOLIDIFICATION, ON-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING	ALTERNATIVE 5*: EXCAVATION, OFF-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT			
Prevent Human Exposure to Contaminated Soils.	No action taken to prevent human exposure to contaminated soils and sediments.	Excavation, treatment, and on-site disposal would prevent direct contact with contaminated materials.	Excavation and off-site disposal would prevent direct contact with contaminated materials.
Prevent Human Exposure to Contaminated Groundwater	No action taken to prevent human exposure to contaminated groundwater. Carcinogenic and non-carcinogenic risks exceeding EPA's target risk range would remain. No actions taken to reduce contaminant leaching to groundwater. No institutional controls implemented to prohibit use of untreated groundwater for drinking water.	Institutional controls would minimize potential exposure to site groundwater by prohibiting its use. Excavation and solidification of soils would reduce leaching of contaminants to groundwater, facilitating natural attenuation of contaminants. In time, contaminant concentrations would reach levels that would not pose excess risk.	Institutional controls would minimize potential exposure to site groundwater by prohibiting its use. Excavation and off-site disposal of soils would reduce leaching of contaminants to groundwater, facilitating natural attenuation of contaminants. In time, contaminant concentrations would reach levels that would not pose excess risk.
Minimize Contaminant Migration to Groundwater and Adjacent Wetlands	No actions taken to reduce contaminant migration to groundwater or wetlands. Contaminants would continue to leach into groundwater and migrate into wetlands via surface runoff.	Excavation and solidification of contaminated soils would reduce leaching of contaminants to groundwater and would reduce migration of contaminants to the environment by surface water and wind erosion.	Excavation and removal of contaminated soils would reduce leaching of contaminants to groundwater and would reduce migration of contaminants to the environment by surface water and wind erosion.

TABLE 6
SITE 19 - COMPARATIVE ANALYSIS OF REMEDIAL ACTION ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

CRITERION:	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 4: EXCAVATION, ON-SITE SOLIDIFICATION, ON-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING	ALTERNATIVE 5*: EXCAVATION, OFF-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING
COMPLIANCE WITH ARARS			
Chemical-Specific ARARs	Would not comply with state groundwater quality standards.	Groundwater contaminant concentrations would initially exceed state GWQC; over time GWQC would be achieved by natural attenuation. A classification exception area (CEA) would be established to provide the state official notification that standards would not be met for a specified duration. Alternative 4 would be implemented in compliance with RCRA Land Disposal Restrictions.	Same as Alternative 4.
Location-Specific ARARs	Not Applicable.	Would comply with federal and state ARARs for wetlands, floodplains, and other sensitive receptors.	Same as Alternative 4.
Action-Specific ARARs	Not Applicable.	If soils and sediments are determined to be hazardous, Alternative 4 would comply with federal and state ARARs for siting and operation of hazardous waste treatment facilities.	If soils and sediments are determined to be hazardous, Alternative 5 would comply with federal and state ARARs for transport/disposal of hazardous waste.

TABLE 6
SITE 19 - COMPARATIVE ANALYSIS OF REMEDIAL ACTION ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

CRITERION:	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 4: EXCAVATION, ON-SITE SOLIDIFICATION, ON-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING	ALTERNATIVE 5*: EXCAVATION, OFF-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING
LONG-TERM EFFECTIVENESS AND PERMANENCE			
Magnitude of Residual Risk	Existing risks would remain: Approximately 3.3 x 1 0 -4 ECR and HI = 3.0 non-carcinogenic risks from exposure to site groundwater; Risks exceeding EPA's protective guideline for exposure to lead in soil, dust, and groundwater (estimated 15.5 percent children exposed may have blood lead levels >10ıg/l vs guideline of maximum 5 percent).	Implementation and enforcement of institutional controls would reduce risks from exposure to site groundwater to less than 1 x 10 -6 and HI less than 1.0. Over time, natural attenuation would result in permanently reduced risks. Excavation, treatment, and on-site containment of contaminated soils and sediments would reduce direct exposure risks to acceptable levels for lead exposure.	Implementation and enforcement of institutional controls would reduce risks from exposure to site groundwater to less than 1 x 10 -6 and HI less than 1.0. Over time, natural attenuation would result in permanently reduced risks. Excavation and off-site disposal of contaminated soils and sediments would reduce direct exposure risks to acceptable levels for lead exposure.
Adequacy and Reliability of Controls	No new controls implemented.	Solidification is a widely demonstrated, reliable technology for immobilization of metals in soils and sediments. Combined with on-site containment, solidification is expected to provide permanent protection from direct contact exposures and long term reduction in contaminant leaching to groundwater.	Because contaminated soils and sediments would be removed, no controls would be necessary for preventing exposure and reducing contaminant migration to the environment. If implemented and enforced, institutional controls could prevent use of contaminated groundwater.
Need for 5-Year Review	Review would be required since soil and groundwater contaminants would be left in place.	Same as Alternative 1.	Review would be required since groundwater contaminants would remain, in excess of GWQC.

TABLE 6
SITE 19 - COMPARATIVE ANALYSIS OF REMEDIAL ACTION ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

CRITERION:	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 4: EXCAVATION, ON-SITE SOLIDIFICATION, ON-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING	ALTERNATIVE 5*: EXCAVATION, OFF-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING
REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT			
Treatment Process Used	None.	Solidification/Natural Attenuation	Natural Attenuation
Amount Treated or Destroyed	None.	260 cubic yards of soil/sediment. All of contaminated groundwater.	All of contaminated groundwater.
Reduction of Toxicity, Mobility, or Volume Through Treatment	No reduction, since no treatment would be employed.	Mobility of metals in soils and sediments reduced through treatment by solidification. Contaminated groundwater treated through natural attenuation.	Contaminated groundwater treated through natural attenuation.
Irreversible Treatment	Not Applicable	Solidification treatment is expected to provide effective long-term immobilization of contaminants. Since contaminants are immobilized, rather than destroyed, treatment may not be irreversible. Contaminated groundwater irreversibly addressed by natural attenuation.	Contaminated groundwater irreversibly addressed by natural attenuation.
Statutory Preference for Treatment	No	Yes	Yes

SHORT-TERM EFFECTIVENESS

Community Protection	No risk to community anticipated.	No significant risk to community anticipated, Engineering controls would be used during implementation to mitigate risks.	Same as Alternative 4.
Worker Protection	No risk to workers anticipated if proper PPE is used during long-term monitoring.	No significant risk to workers anticipated if proper PPE is used during remediation and long-term monitoring.	Same as Alternative 4.

TABLE 6
SITE 19 - COMPARATIVE ANALYSIS OF REMEDIAL ACTION ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

CRITERION:	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 4: EXCAVATION, ON-SITE SOLIDIFICATION, ON-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING	ALTERNATIVE 5*: EXCAVATION, OFF-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING
Environmental impacts	No adverse impacts to the environment anticipated.	No significant impacts to the environment anticipated. Engineering controls would be used during implementation to mitigate risks.	Same as Alternative 4.
Time Until Action is Complete	Not applicable.	8 months until RAOs for exposure to contaminated soils and sediments achieved. 1 year until RAOs for exposure to site groundwater are achieved.	Alternative 5A: 2.5 months until RAOs for exposure to contaminated soils and sediments achieved. Alternative 5A: 11 months until RAOs for exposure to contaminated soils and sediments achieved (including time to prepare Site 4 landfill for acceptance of excavated soils). Both 5A and 5B: 1 year until RAOs for exposure to site groundwater are achieved.
IMPLEMENTABILITY			
Ability to Construct and Operate	No construction or operation involved.	No construction or operational difficulties anticipated. Common construction techniques used for excavation and on-site disposal. Precautions would be taken to minimize damage to wetlands during excavation. Solidification is a well demonstrated technology employing common equipment and materials.	No construction or operational difficulties anticipated. Common construction techniques and equipment used for excavation and off site disposal, Precautions would be taken to minimize damage to wetlands during excavation.

TABLE 6
SITE 19 - COMPARATIVE ANALYSIS OF REMEDIAL ACTION ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

CRITERION:	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 4: EXCAVATION, ON-SITE SOLIDIFICATION, ON-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING	ALTERNATIVE 5*: EXCAVATION, OFF-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING
Ease of Doing More Action if Needed	Additional actions would be easily implemented if required.	If additional actions are warranted, the solidified materials could be excavated and removed.	Same as Alternative 1.
Ability to Monitor Effectiveness	Monitoring would provide assessment of potential exposures, contaminant presence, migration, or changes in site conditions.	Same as Alternative 1.	Same as Alternative 1.
Ability to Obtain Approvals and Coordinate with Other Agencies	Coordination for 5-year reviews may be required and would be obtainable.	Coordination for 5-year reviews may be required and would be obtainable. Coordination with the state would be required to establish a CEA and would be obtainable.	Coordination for 5-year reviews may be required and would be obtainable. Coordination with the state would be required to establish a CEA and would be obtainable. Alt. 5A: manifests would be required for off-site transportation and disposal of contaminated materials.
Availability of Treatment, Storage Capacities, and Disposal Services	None required.	No off-site TSD capacity or services required. Ample availability of companies to provide equipment and services for solidification treatment.	Alt. 5A: Sufficient commercial landfill capacity available for materials requiring disposal. Alt. 5B: Sufficient area available for disposal of materials at the Site 4 landfill.
Availability of Equipment, Specialists, and Materials	Personnel and equipment available for implementation of long-term monitoring and 5- year reviews.	Ample availability of companies with trained personnel, equipment, and materials to perform excavation, treatment, disposal, long-term monitoring, and 5-year reviews.	Ample availability of companies with trained personnel, equipment, and materials to perform excavation, off-site disposal, long-term monitoring, and 5 year reviews.

TABLE 6
SITE 19 - COMPARATIVE ANALYSIS OF REMEDIAL ACTION ALTERNATIVES
NWS EARLE, COLTS NECK, NEW JERSEY

CRITERION:	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 4: EXCAVATION, ON-SITE SOLIDIFICATION, ON-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING	ALTERNATIVE 5*: EXCAVATION, OFF-SITE DISPOSAL, NATURAL ATTENUATION, AND LONG-TERM MONITORING
Availability of Technology	Not required.	Solidification is a well demonstrated technology employing relative common and available equipment and materials, Several vendors are available that could provide the necessary equipment and materials.	Common construction techniques and materials required for excavation and off-site disposal
COST			
Capital Cost	$0	$491,000	Alt. 5A: $375,000 Alt. 5B: $153,000
First-Year Annual O&M Cost	$16,200	$21,600	Alt. 5A: $21,600 Alt. 5B: $21,600
Present Worth Cost**	$234,000	$793,000	Alt. 5A: $677,000 Alt. 5B: $455,000

Notes:
* Evaluation presented pertains to Alternative 5A (off-base disposal) and Alternative 513 (on-base disposal) unless otherwise noted.
** Present worth cost is based on discount rate of 7%.

C. Long-Term Effectiveness and Permanence

Since no remedial actions would occur under Alternative 1 to treat, contain, or remove contaminated soils and sediments, the current and future threats to human health and the environment from direct exposure to these media would remain, and contaminant migration to groundwater would continue. Because no institutional controls would be implemented to prohibit use of untreated contaminated groundwater, the risk to potential future users of the groundwater would remain unchanged.

Only Alternatives 4 and 5 offer Long-term protection of human health and the environment. Alternatives 4 and 5 would reduce human and ecological risks due to direct exposure to site contaminants by eliminating the potential for exposure. Alternative 4 would achieve Long-term protection by immobilizing contaminants and disposing treated soils in an on-site containment cell. Monitoring would ensure the long-term effectiveness and permanence of treatment Alternative 5 would achieve Long-term protection by excavating and disposing of soils either off site or at an on-base landfill. The action would permanently reduce risks at Site 19, but contaminant mobility in the environment would not be reduced. The requirement for long-term monitoring would be transferred to the disposal location.

Long-term risks due to ingestion of site groundwater would be reduced under Alternatives 4 and 5 by reducing contaminant leaching into groundwater and by implementing institutional controls to prohibit use of untreated, contaminated groundwater until ARARs are met Alternative 1 would not include any measures to reduce these risks.

D. Reduction of Toxicity Mobility, or Volume Through Treatment

Only Alternative 4 would reduce the mobility of soil/sediment contaminants through treatment. Because neither Alternative 1 nor Alternative 5 includes soil/sediment treatment, neither would reduce the toxicity, mobility, or volume through treatment.

With source removal, natural attenuation would reduce the toxicity, mobility, and volume of contaminated groundwater over time under Alternatives 4 and 5.

E. Short-Term Effectiveness

The short-term effectiveness of the three alternatives would be similar since the use of appropriate engineering controls and personal protective equipment (PPE) would be expected to minimize adverse impacts to Base residents and personnel, the local community, and workers during implementation.

Long-term monitoring, the only on-site activity proposed under Alternative 1, would provide little opportunity for short-term impact to the local community or the environment

Alternatives 4 and 5 would present a greater opportunity for short-term impacts to human health and the environment due to excavation and handling of contaminated soils and sediments. Alternative 5A would present the greatest opportunity for short-term impact because it includes off-base transport of contaminated soils/sediments. In all cases, short-term risks posed to base personnet site workers, and the environment under either alternative would be mitigated through use of engineering controls and appropriate PPE. No permanent adverse impacts to human health or the environment are anticipated to result from implementation of Alternatives 4 or 5.

F. Implementability

Each of the alternatives would be implementable. Alternative 1 is the most easily implemented since the only activities proposed are Long-term monitoring and 5-year reviews.

Alternative 5A would be the next easiest to implement because it involves only excavation and off site transport and disposal. A number of companies with the trained personnel, equipment, and materials to perform excavation, disposal, and Long-term monitoring are available. Sufficient commercial landfill capacity is available to handle the small volume of contaminated materials (approximately 260 cubic yards)

that would require off-base disposal under Alternative 5A.

Alternative 4 would be somewhat more difficult to implement because it would require mobilization and operation of an on-site treatment system. However, solidification is a well-demonstrated technology employing relatively common equipment and materials, and several vendors are available that could provide the necessary equipment materials, and services.

If additional actions are warranted, they could be easily implemented under Alternatives 1 and 5. Under Alternative 4, additional actions could be implemented; however, excavation and removal of the solidified materials may be required.

G. Cost

Alternative 1, no action, would cost the least to implement and Alternative 4 would cost the most to implement. Alternative 5A costs more to implement than Alternative 5B (Alternative 5A is preferred over

Alternative 5B because of the relatively small volume of soil/sediments and their known contamination with metals).

No capital costs are associated with the no-action alternative. The average annual O&M cost for Long-term monitoring is $21,600 and 5-year reviews are $15,500 per event. Over a 30-year period, the net present-worth cost is $302,000.

The capital costs for Alternative 4 total $491,000. The average annual O&M costs are $21,600, and 5-year reviews cost $15,500 per event. Over a 30-year period, the net present-worth cost is $793,000.

The capital costs for Alternative 5A total $375,000. The average annual O&M costs are $21,600, and 5-year reviews cost $15,500 per event. Over a 30-year period, the net present-worth cost is $677,000.

The capital costs for Alternative 5B total $153,000. The average annual O&M costs are $21,600, and 5-year reviews cost $15,500 per event. Over a 30-year period, the net present-worth cost is $455,000. These costs do not include those for off-site disposal of any material determined to be hazardous. Alternative 5A is preferred over Alternative 5B. Costs for 5B are presented here for completness purposes.

H. Agency Acceptance

The NJDEP has had the opportunity to review and comment on all the documents in the Administrative Record and has had the opportunity to comment on the draft ROD. Comments received from the NJDEP have been incorporated into the ROD.

I. Community Acceptance

The community has had the opportunity to review and comment on documents in the Administrative Record and has participated in regularly scheduled Restoration Advisory Board (RAB) meetings convened to encourage community involvement. A public meeting was held to provide the community an opportunity to hear about the Proposed Plan.

The community has not indicated objections to the alternatives selected in this ROD. Part III, Responsiveness Summary, of this ROD presents an overview of community involvement and input to the selected alternative.

X. THE SELECTED REMEDY

The Navy, with the support of EPA, in consultation with NJDEP has selected Alternative 5A: Excavation and Off-Base Disposal as the preferred alternative for remediation of contaminated sediments and soils and prevention of further leaching of metals to groundwater. This alternative would reduce unacceptable human health risks and threats to ecological receptors in the vicinity by removing the metals-laden

sediments and contaminated soil for consolidation/disposal off site at a permitted hazardous waste disposal facility if excavated material is found to be hazardous.

Implementation of Alternative 5A would comply with all ARARs identified in the FS. The preferred alternative is believed to provide the best balance of protection among the alternatives with respect to response criteria. GWQS would eventually be met through natural attenuation and a provision is included to seek a CEA in the area immediately adjacent and (approximately 800 - 1,000 feet) downgradient of the site to protect potential receptors until the GWQS are achieved. Additional groundwater monitoring, wells would be installed downgradient of MW19-07 to evaluate the protectiveness of the remedy.

Based on available information, the Navy and EPA believe the preferred alternative would be protective of human health and the environment, would be cost effective, and would be in compliance with all statutory requirements of EPA, the state, and the local community.

XI. STATUTORY DETERMINATIONS

The remedy selected for OU-2 (Alternative 5A) satisfies the remedy selection requirements of CERCLA and the NCP. The remedy is expected to be protective of human health and the environment, complies with ARARs, and is cost effective. The following sections discuss how the selected remedial action addresses these statutory requirements.

A. Protection of Human Health and the Environment

Alternative 5A would provide overall protection of human health and the environment by preventing direct exposure to contaminated materials, reducing contaminant migration from the site into the environment, and instituting restrictions on use of site groundwater.

Alternative 5A would also reduce the risks posed by future use of site groundwater. The human health risk assessment concluded that site groundwater poses carcinogenic and non-carcinogenic risks exceeding EPA's target risk range under a future residential exposure scenario. Removal of contaminated soil and sediment would significantly reduce contaminant leaching from the site to the underlying groundwater and would facilitate natural attenuation of the groundwater contamination. Reducing leaching of contaminants from the soil and sediment into the underlying groundwater will eventually result in a decrease of groundwater contaminant concentrations to acceptable levels (GMS), reducing the Long-term risk posed by future use of site groundwater. Modeling predicts that an estimated 191 feet downgradient of the site was the maximum distance where metals in groundwater would exceed either GWQS or background levels. Establishing the site as a groundwater CEA would provide interim protection by prohibiting use of the aquifer until GWQS are achieved.

The Long-term periodic monitoring program would allow the responsible agency to monitor the quality of groundwater leaving the site, assess potential impacts to downgradient receptors, and determine whether additional remedial actions are necessary. Long-term monitoring will be quarterly until such time as EPA and the Navy agree on a reduced schedule.

Use of engineering controls to minimize generation of fugitive dusts and vapors and proper use of PPE by site workers would effectively minimize Short-term risks to the local community and workers posed by implementation of this alternative.

B. Compliance with and Attainment of ARARs

The selected remedy for OU-2 complies with all applicable or relevant and appropriate chemical-specific, location-specific, and action-specific ARARs. Tables 7 through 12 summarize ARARs and TBCs applicable to OU-2.

1. Chemical-Specific ARARs

Potential federal and state chemical-specific ARARs are listed in Tables 7 and 8, respectively. Implementaition of Alternative 5A would comply with the ARARs identified in Tables 6 and 7. Because

Alternative 5A does not include active treatment of groundwater, initially the groundwater beneath Site 19 would not meet the constituent concentrations specified in the New Jersey GWQS [N.J.A.C. 7:9-6]. However, removal of contaminated soils and sediments would reduce migration of contaiminants into groundwater, facilitating natural attenuation of contaminants and ultimately resulting in attainment of GWQS. Alternative 5A includes a provision to seek a temporary exemption (CEA) from these requirements until the GWQS are achieved through natural attenuation. The CEA would be established to provide the state official notice that the constituent standards would not be met for a specified duration and to ensure that consumption of the untreated groundwater is prohibited.

TABLE 7
POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
Safe Drinking Water Act(SDWA)-Maximum Cataminant Level (MCLs)(40 CFR 141.11-141.16)	Potentially Relevant and Appropriate	MCLs have been promulgated for a number of common organic and inorganic contaminants to regulate the concentration of contaminants in public drinking water supply systems. MCLs may be relevant and appropriate for groundwater because the aquifer beneath the site is a potential drinking water supply.	MCLs may be used to establish clean-up levels for the portion of the aquifer underlying the OU-1 sites. MCLs can be used to derive potential soil cleanup levels.
Resource Conservation and Recovery Act (RCRA)-Groundwater Protection Standard (40 CFR 264.94)	Potentially Relevant and Appropriate	The RCRA groundwater protection standard is established for groundwater monitoring of RCRA permitted treatment, storage or disposal facilities. standard is set at either an existing or proposed RCRA-MCL, background concentration, or an alternate concentration limit (ACL) protective of human health and the environment.	RCRA-MCLs may be used or ACLs may be The developed to identify levels of contamination in the aquifer above which human health and the environment are at risk and to provide an indicator when corrective action is necessary.
RCRA Land Disposal Restrictions (40 CFR 268)	Potentially Applicable	These regulations identify hazardous wastes that are restricted from land disposal and establish waste analysis and recordkeeping requirements and "treatment standards" (concentration levels or methods of treatment) that wastes must meet in order to be eligible for land disposal.	Contaminated soil must be analyzed and disposed in accordance with the requirements of these regulations. If necessary, soils will be treated to attain applicable "treatment standards" prior to placement in a landfill, or other land disposal facility. This requirement would be considered for alternatives involving land disposal.
Clean Water Act - Ambient Water Quality Criteria (AWQC)	To be Considered	AWQC are non-promulgated health-based surface water quality criteria that have been developed for carcinogenic and non-carcinogenic compounds for the protection of human health. AWQC have also been developed for the protection of aquatic organisms.	AWQC may be used to assess need for remediation of discharges to surface water, or to use as benchmarks during long-term monitoring.

TABLE 7
POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
SDWA Maximum Contaminant Level Goals (MCLGs)(40 CFR 141.50 and 14151)	To Be Considered	MCLGs are health-based limits for contaminant concentrations in drinking water. MCLGs are established at levels at which no known or anticipated adverse effects on human health are anticipated and which allow for an adequate margin of safety. MCLGs are set without regard for cost or feasibility.	Non-zero MCLGs may be used as clean-up levels if conditions at the site justify setting cleanup levels lower than MCLs.
Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities (OSWER Directive No. 9355.4-12)(Jul 1994)	To Be Considered	This OSWER Directive recommends a lead soil screening level of 400 ppm for residential land use based on the IEUBK model. The screening value may be used to determine whether sites or portions of sites warrant further evaluation and evaluations of risks.	If any of the OU-1 sites is to be considered for eventual residential use, then the screening value may be used to assess whether site-specific lead levels require further evaluation and possible remediation.
EPA Groundwater Protection Strategy	To Be Considered	Provides classification and restoration goals for groundwater based on its vulnerability, use, and value.	This strategy was considered in conjunction with the Federal SDWA and State Groundwater Protection Rules in order to determine groundwater cleanup levels.
Risk Based Concentration (RBC)	To Be Considered	RBCs are developed based on estimating a concentration in a specific media (i.e., air, water or soil) that is associated with specific exposure assumptions and a specific risk level (i.e., Hazard Quotient of 1 or a Cancer Risk of 1 X 10E-6). The selection of specific exposure parameters and risk levels also contribute to the calculated risk-based concentration.	RBCs may be used to develop clean-up goals based on human health criteria.

TABLE 7
POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
EPA Health Advisories and Acceptable Intake Health Assessment Documents	To Be Considered	Intended for use in qualitative human health evaluation of remedial alternatives.	These advisories and health assessment documents were used in assessing health risks from contaminants present at the site.
Clean Air Act- Standards for Air Emissions from Municipal Solid Waste Landfills (40 CFR 60.752 and 60.753)	Potentially Relevant and Appropriate	Active landfills with design capacities equal to or greater than 2.5 million cubic meters are required to have landfill gas collection and control systems if greater than 50 megagrams of non-methane organic compounds are expected to be emitted. The collection system shall be operated so that the methane concentration is less than 500 ppm above background at the surface of the landfill.	Both Sites 4 and 5 landfills are estimated to be much less than 2 million cubic feet in capacity. However, soil gas studies and measurement of methane concentrations at the landfill surfaces need to be conducted during the pre-design phase to determine whether landfill gas controls need to be included as part of the control

TABLE 8
POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
New Jersey Ground Water Quality Standards (SWQS)(N.J.A.C. 7:9-6)	Applicable	This regulation establishes the rules to protect ambient ground water quality through establishing groundwater protection and clean up standards, and setting numerical criteria limits for discharges to ground water. The Ground Water Criteria (GWQC) (N.J.A.C. 7:9-6.7) are the maximum allowable pollutant concentrations in ground water that are protective of human health. This regulation also prohibits the discharges to groundwater that subsequently discharges to surface water, which do not comply the Surface Water Quality Standards (SWQS).	Because contaminated groundwater is present underneath the OU-1 sites in excess of GWQS, these requlations will be considered in determining groundwater action levels. Applicable for Classification Exception Area (CEA) may be required if GWQS will not be met during the term of proposed remediation. The CEA procedure ensures that designated groundwater uses at remediation sites are suspended for the term of the CEA.
New Jersey Surface Water Quality Standards (SWQS)(N.J.A.C. 7:9B)	Applicable	These standards establish rules to protect and enhance surface water resources, define surface water classifications and uses, establish water quality based criteria, and effluent discharge limitations. The Surface Water Criteria (SWQC)(N.J.A.C. 7:9B-14) are the maximum allowable pollutant concentrations in surface water for the designated use.	For alternatives where surface water may be affected, remedial measures may be needed so that the SWQC are attained in the long term. Remedial alternatives shall consider action to mitigate the continued contamination of surface waters.
New Jersey Safe Drinking Water Act (N.J.A.C. 7:10)	Potentially Relevant and Appropriate	These regulations were promulgated to assure the provision of safe drinking water to consumers in public conmmunity water systems. Maximum Contaminant Levels (MCLs)(N.J.A.C. 7:10-16) have been established to regulate the concentration of organic and metal contaminants in water supplies. MCLs may be relevant and appropriate for groundwater because the aquifer beneath the site is a potential drinking water supply.	MCLs may be used to establish clean-up levels for groundwater underlying the OU-1 sites. MCLs can be used to derive potential soil cleanup levels.

TABLE 8
POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
New Jersey Soil Cleanup Criteria	To Be Considered	These are non-promulgated soils cleanup criteria for residential direct contact, non-residential direct contact, and impact to ground water (through leaching).	These criteria will be considered in the development of soil cleanup goals.

TABLE 9
POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
Wetlands Executive Order (E.O. 11990)& 40 CFR 6, App. A (Policy on Implementing E.O. 11990)	Potentially Applicable	Federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands.	Remedial alternatives that involve excavation or deposition of materials will include all practicable means of minimizing harm to the wetlands adjacent to the OU-1 sites. Wetlands protection consideration will be incorporated into the planning, decision-making, and implementation of remedial alternatives.
Floodplains Executive Order (E.O. 11988) & 40 CFR 6, App. A (Policy on Implementing E.O. 11988)	Potentially Applicable	Federal agencies are required to reduce the risk of flood loss, minimize impact of floods, and restore and preserve the natural and beneficial value of floodplains.	The potential effects on floodplains will be considered during the development and evaluation of remedial alternatives. All practicable measures will be taken to minimize adverse effects on floodplains.
Resource Conservation and Recovery Act (RCRA) Location Standards, Floodplains (40 CFR 264.18 (a))	Potentially Applicable	Any RCRA facility that treats, stores, or disposes of hazardous waste, if situated in a 100-year floodplain, must be designed, constructed, operated, and maintained to avoid washout.	Where possible, remedial alternatives that include construction of a treatment, storage, or disposal facility will be sited outside of a 100-year floodplain.
Endangered Species Act of 1973 (16 USC 1531 et seq.);(50 CFR Part 200)	Potentially Applicable, if present	Actions shall be taken to conserve endangered or threatened species, or to protect critical habitats. Consultation with the Department of the Interior is required.	The RI determined that there were no sensitive habitats (except for wetlands), endangered or threatened species present at the OU-1 sites.
Fish and Wildlife Coordination Act Of 1958 (16 U.S.C. 661) Protection of Wildlife Habitats	Potentially Applicable	This regulation requires that any Federal agency that proposes to modify a body of water must consult with the U.S. Fish and Wildlife Service, and requires that actions be taken to avoid adverse effects, minimize potential harm to fish or wildlife, and to preserve natural and beneficial uses of the land.	During the evaluation of alternatives, potential remediation effects on the wetlands and floodplains are evaluated. If it is determined that an impact may occur, then the U.S. Fish and Wildlife Service, the NJDEP, and EPA would be consulted.

TABLE 9
POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
National Historic Preservation Act of 1966 Section 106 (16 USC 470 et. seq.)	Potentially Applicable, if present	Action will be taken to recover and to preserve historic artifacts that may be threatened as the result of terrain alteration.	Potential ARAR if artifacts are encountered during active site remediation (e.g. excavation, consolidation, grading). To date, no such artifacts have been encountered at the OU-1 sites.
National Archeological and Historic Preservation Act of 1974 (132 CFR 229)	Potentially Applicable, if present	Action will be taken to recover and to preserve scientific, prehistoric, or archaeologic artifacts that may be threatened as the result of terrain alteration.	Potential ARAR if artifacts are encountered during active site remediation (e.g. excavation, consolidation, grading). To date, no such artifacts have been encountered at the OU-1 sites.

TABLE 10
POTENTIAL FEDERAL LOCATION-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
New Jersey Freshwater Wetlands Protected Act Rules (N.J.A.C. 7:7A)	Potentially Applicable	Regulate activities that result in the disturbance in and around fresh water wetland areas including: removing or dredging wetland soils, disturbing the water level or water table, driving piles, placing of obstructions, destroying plant life, and discharging dredged or fill materials into open water.	Remedial alternatives will be developed to avoid activities that would be detrimental to the wetlands located adjacent to the OU-1 sites.
New Jersey Freshwater Wetlands Protecton Act Rules, Mitigation (N.J.A.C. 7:7A-14)	Potentially Applicable	This regulation requires mitigation of the disturbed wetlands or filled open water. Generally requires the restoration, creation, or enhancement of area, or donations to the Mitigation Bank, of equal ecological value.	If a remedial alternative action results in the loss of wetlands through dredging, filling, or construction activities, then mitigation measures will need to be incorporated into the alternative's design.
New Jersey Flood Hazard Area Control (N.J.A.C. 7:14)	Potentially Applicable	These regulations control development in floodplains and water course that may adversely affect the flood-carrying capacity of these features, subject new facilities to flooding, increase storm water runoff, degrade water quality, or result in increased sedimentation, erosion, or environmental damage.	This requirement is applicable to remedial alternative actions that may adversely affect floodplains adjacent to the OU-1 sites.
New Jersey Siting Criteria for New Major Commercial Hazardous Waste Facilities (N.J.A.C. 7:26-13)	Potentially Relevant and Appropriate	These regulations specify siting requirements and limitations for commerical hazardous waste facilities including protection of nearby residents, surface water, groundwater, air, and environmentally sensitive areas.	If remedial alternatives employs an on-site or on- base treatment of contaminated soils, sediments, or materials, then remediation activities will need to be consistent with these requirements.

TABLE 11
POTENTIAL FEDERAL ACTION-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
Resource Conservation and Recovery Act (RCRA) - Hazardous Waste Generator and Transporter Requirements (40 CFR parts 262 and 263)	Potentially Applicable	These regulations establish the responsibilities of generators and transporters of hazardous waste in the handling, transportation, and management of waste. The regulations specify the packaging, labeling, recordkeeping, and manifest requirements.	Activities performed in connection with off-site transport of hazardous wastes will comply with the requirements of these regulations.
RCRA - General Facility Standards (40 CFR 265 Subpart B)	Potentially Applicable	General facility requirements outline general waste analysis, security measures, inspections, and training requirements.	If a remedial alternative includes the establishment of an on-base treatment facility for hazardous wastes (characteristic or listed), then this regulation will be considered. This regulation specifies TSD facilities construction, fencing, postings, and operations. All workers will be property trained. Process wastes will be evaluated for the characteristics of hazardous wastes to assess further handling requirements.
RCRA - Preparedness and Prevention (40 CFR 265 Subpart C)	Potentially Applicable	Outlines requirements for safety equipment and spill control.	If a remedial alternative includes treatment, storage, or disposal of hazardous wastes, then this regulation will be considered. Safety and communication equipment will be maintained at the site. Local authorities will be familiarized with the site operations.
RCRA - Contingency Plan and Emergency Procedures (40 CFR 265 Subpart D)	Potentially Applicable	Outlines requirements for emergency procedures to be used following explosions, fires, etc.	If the alternative includes treatment, storage, or disposal of hazardous wastes, then contingency plans will be developed. Copies of the plans will be kept on-site.
RCRA - Manifesting Recordkeepng, and Reporting (40 CFR 265 Subpart	Potentially Applicable	Specifies the recordkeeping end reporting requirements for RCRA facilities.	If the alternative includes treatment, storage, or disposal of hazardous wastes, then records of facility E) activities will be developed and maintained during remedial actions.

TABLE 11
POTENTIAL FEDERAL ACTION-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
RCRA - Closure end Post-Closure (40 CFR 258, Subpart F)	Potentially Relevant and Appropriate	Details specific requirements for closure and pos-closure of municipal solid waste landfills. Final cover requirements that address minimizing infiltration and erosion are identified in this regulation. Following closure, post-closure requirements include preparing a post-closure plan, maintaining integrity and effectiveness of the final cover, groundwater monitoring, and maintaining and operating a gas collection system.	If an alternative includes closure of a solid waste landfill, then these requirements will be considered in formulating the alternative.
RCRA - Land Treatment (40 CFR 265 Subpart M)	Potentially Applicable	These regulation detail the requirements for conducting land treatment of RCRA hazardous waste.	Alternatives that involve on-site treatment of hazardous wastes (contaminated soil or sediments) will comply with these regulations.
RCRA - Thermal Treatment (40 CFR 265 Subpart P)	Potentially Applicable	This regulation details operating requirements and performance standards for thermal treatment of hazardous wastes.	Alternatives that include thermal or catalytic oxidation of offgases would be designed and operated in compliance with this regulation.
RCRA - Miscellaneous Treatment Units (40 CFR 264 Subpart X)	Potentially Applicable	The regulation details design and operating standards for units in which hazardous waste a treated.	Hazardous waste treatment units used for on-site or on-base treatment of contaminated media must meet these requirements.
RCRA - Air Emission Standards for Process Vents (40 CFR 265 Subpart AA)	Potentially Applicable	This regulation contains air pollutant emission standards for process vents, closed-vent system, and control devices at hazardous waste TSD facilities. This subpart applies to equipment associated with solvent extraction or air/Steam stripping operations that treat wastes that are identified or listed RCRA hazardous wastes and have a total organics concentration of 10 ppm or greater.	These standards will be considered during development and design of alternatives that include treatment of VOC-contaminated soils. All emissions from treatment units will be monitored to ensure compliance with this ARAR

TABLE 11
POTENTIAL FEDERAL ACTION-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
OSWER Directive 9355.0-62FS Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfill (Interim Guidance) (April 1996)	To Be Considered	This EPA directive provides guidance in evaluating military landfill sites and determining whether presumptive remedies can be applied.	The procedures and suggested remedial actions will be considered in formulating remedial alternatives for Sites 4 and 5.
OSWER Directive 9355.0-49FS Presumptive Remedy for CERCLA Municipal Landfill Sites (Sept 1993)	To Be Considered	This EPA directive provides guidance in evaluating CERCLA municipal landfill sites and determining if presumptive remedies can be applied.	The procedures and suggested remedial actions will be considered in formulating remedial alternatives for Sites 4 and 5.

TABLE 12
POTENTIAL FEDERAL ACTION-SPECIFIC ARARs AND TBCs
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
N.J.S.A. 58:10B	Applicable	Establishes New Jersey's acceptable risk range of 10 E-06 (one cancer in a million).	New Jersey water quality standards and soil clean-up criteria are based on this risk level.
New Jersey Labeling, Records, and Transportation Requirements (N.J.A.C. 7:26-7)	Potentially Applicable	These regulations establish the responsibilities of generators and transporters of hazardous waste in the handling, transportation, and management of waste. The regulations specify the packing, labeling, recordkeeping, and manifest requirements.	Activities performed in connection with off-site transport of hazardous wastes will comply wrth the requirements of these regulations.
New Jersey Requirements for Hazardous Waste Facilities (N.J.A.C. 7:26-9)	Potentially Applicable	These regulations identify requirements for facilities in general, groundwater monitoring, preparedness and prevention, contigency and emergency procedures, and general closure and post-closure.	If a remedial alternative includes the establishment of an on-base treatment facility for contaminated soils and materials, then this regulation will be complied with during implementation.
New Jersey Closure and Post-Closure Care of Sanitary Landfills Regulations (N.J.A.C. 26:2A.9)	Potentially Relevant and Appropriate	Details specific requirements for closure and pos-closure of municipal solid waste landfills. Final cover requirements that address minimizing infiltration and erosion are identified in this regulation. Following closure, post-closure requirements include preparing a post-closure plan, maintaining integrity and effectiveness of final cover, groundwater monitoring, and maintaining and operating a gas collection system.	If an alternative includes closure of a solid waste landfill, then these requirements, will be considered in formulating the alternative.
New Jersey Thermal Treatment Regulations (N.J.A.C. 7:26-11.6)	Potentially Applicable	These regulations detail operating requirements, waste analyses and monitoring of treatment conditions, performance standards, and closure of existing facilities that thermally treat hazardous wastes.	Alternatives that include thermal treatment of contaminated soils, sediments, and materials would be designed and operated in consistent with this regulation.

TABLE 12
POTENTIAL STATE ACTION-SPECIFIC ARARs AND TBCc
NAVAL WEAPON STATION EARLE, COLTS NECK, NEW JERSEY

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	COMMENTS
New Jersey Chemical, Physical, and Biological Treatment Regulations (N.J.A.C. 7:26-11.7)	Potentially Applicable	These regulations detail operating requirements, waste analyses and monitoring of treatment conditions, and closure of existing facilities that physically, chemically, or biologically treat hazardous wastes. Also governs handling and compatibility of wastes in treatment process.	Alternatives that include physical, chemical, of biological treatment of contaminated soils, sediments, and materials would be designed and operated in consistent with this regulation.
New Jersey Control and Prohibition of All Pollution by Toxic Substances (N.J.A.C. 7:27-17)	Potentially Applicable if emissions greater than 45.4 g/hr (0.1 lb/hr)	Thess regulations govern the emission of Group I and Group II toxic volatile organic compounds (TXS) to the ambient air. Group I TXS would be addressed through adequate stack height or prevention of aerodynamic downwash. Group II TXS would be addressed through reasonably available control technology.	Alternatives that may result in the release of (Group I of Group II TXS to the ambient air, exceeding 0.1 lb/hr, would incorporate appropriate vapor control measure to comply with these requirements.

2. Location-Specific ARARs

Potential federal and state location-specific ARARs are listed in Tables 9 and 10, respectively. The potential effects of the proposed remediation on wetlands, floodplains, water bodies, and other sensitive receptors would be identified during the design of Alternative 5A and all necessary measures would be taken to comply with the location-specific federal and state ARARs identified in Tables 9 and 10. It is expected that Alternative 5A would easily comply with these ARARs.

3. Action-Specific ARARs

Potential federal and state action-specific ARARs are listed in Tables 11 and 12, respectively. The selected remedy for OU-2 would comply with all action-specific ARARs such as NJDEP waste documentation and labeling requirements or Federal Preparedness and Prevention planning.

C. Cost-Effectiveness

The Navy and EPA have determined that the selected remedy for OU-2 is cost effective in that it mitigates the risks posed by the site-related contaminants, meets all other requirements of CERCLA, and affords overall effectiveness proportionate to the cost. The estimated capital costs for Alternative 5A total $375,000. The average annual O&M costs are $21,600, and 5-year reviews cost $15,500 per event Over a 30-year period, the net present-worth cost is $677,000 (at a 7 percent discount rate).

D. Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The Navy and EPA have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies ran be utilized in a cost-effective manner at OU-2.

E. Preference for Treatment as a Principal Element

Due to the relatively small volume of contaminated soil and sediment, excavation and off-site disposal represent a proven, cost-effective method for removal of contaminated materials.

XII. DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes from the Proposed Plan appear in this ROD. The actual cost of capping sites 4 and 5 will depend on delineation of the former fill area at both sites during design.

RECORD OF DECISION
NAVAL WEAPONS STATION EARLE
OPERABLE UNIT 2

PART III - RESPONSIVENESS SUMMARY

The purpose of this Responsiveness Summary is to review public response to the Proposed Plan for OU-2. It also documents the consideration of comments during the decision-making process and provides answers to any comments raised during the public comment period.

The Responsiveness Summary for OU-2 is divided into the following sections:

- Overview - This section briefly describes the remedial alternative recommended in the Proposed Plan and any impacts on the Proposed Plan due to public comment.
- Background on Community Involvement - This secton describes community relations activities conducted with respect to the area of concern.
- Summary of Major Questions and Comments - This section summarizes verbal and written comments received during the public meetng and public comment period.

I. OVERVIEW

This Responsiveness Summary addresses public response to the Proposed Plan. The Proposed Plan and other supporting information were maintained for public review in the Administrative Record file for OU-2, which was maintained at the Monmouth County Library (Eastern Branch) in Shrewsbury, New Jersey.

II. BACKGROUND ON COMMUNITY INVOLVEMENT

This section provides a brief history of community participation in the investigation and interim remedial planning activities conducted for OU-2. Throughout the investigation period, EPA and NJDEP have been reviewing work plans and reports and have been providing comments and recommendations, which were incorporated into appropriate documents. A Technical Review Committee (TRC), consisting of representatives from the Navy, EPA, NJDEP, the Monmouth County Health Department, and other agencies and local groups surrounding NWS Earle, was formed. The TRC later was transformal into the Restoration Advisory Board (RAB) to include community members as well as the original officials, from the TRC, and has been holding periodic meetings to maintain open lines of communication with the community and to inform all parties of current activities.

On April 18, 20, and 21, 1997, a newspaper notification inviting public comment on the Proposed Plan appeared in the Asbury Park Press. The public notice summarized the Proposed Plan and the preferred alternative. The announcement also identified the time and location of the public meeting and specified a public comment period as well as the address to which written comments could be sent Public comments were accepted from March 21, 1997 to April 30, 1997. The newspaper notification also identified the Monmouth County Library as the location of the Administrative Record.

The public meeting was held on April 24, 1997 from 7:00 p.m. to 9:00 p.m. at the Colts Neck Courthouse in the Colts Neck Municipal Building. Cedar Drive, Colts Neck, New Jersey. At this meeting, representatives from the Navy, EPA, and NJDEP were available to answer questions concerning OU-2 and the preferred alternative. The complete attendance list is included in Appendix B.

III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS

A. Written Comments

During the public comment period from March 21 to April 30, 1997, no written comments were received from

the public pertaining to OU-2. No new comments were received from the NJDEP or EPA.

B. Public Meeting Comments

One comment concerning OU-2 was received at the April 24, 1997 public meeting. Mr Lester Jargowsky stated that the Monmouth County Health Department concurred with the Proposed Plan for Site 19.

APPENDIX A
TERMS USED IN THE RECORD OF DECISION

1,2-Dichloroethene (1,2-DCE): Common volatile organic solvent formerly used for cleaning, degreasing, or other uses in commerce and industry.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal and state requirements that a selected remedy must attain. These requirements may vary among sites and remedial activities.

Administrative Record: An official compilation of site-related documents, data, reports, and other information that are considered important to the status of and decisions made relative to a Superfund site. The public has access to this material.

Carcinogenic: A type of risk resulting from exposure to chemicals that may cause cancer in one or more organs.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The Act created a trust fund, known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous substance facilities.

Feasibility Study (FS): Report identifying and evaluating alternatives for addressing the contamination present at a site or group of sites.

Groundwater Quality Standards (GWQS): New-Jersey-promulgated groundwater quality requirements, N.J.A.C. 7:9-6.

Hazard Index (H: The sum of chemical-specific Hazard Quotients. A Hazard Index of greater than 1 is associated with an increased level of concern about adverse non-cancer health effects.

Hazard Quotient (HQ): A comparison of the level of exposure to a substance in contact with the body per unit time to a chemical-specific Reference Dose to evaluate potential non-cancer health effects. Exceedence of a Hazard Quotient of 1 is associated with an increased level of concern about adverse non-cancer health effects.

Initial Assessment Study (IAS): Preliminary investigation usually consisting of review of available data and information of a site, interviews, and a non-sampling site visit to observe areas of potential waste disposal and migration pathways.

Land Disposal Resftictions (LDRs): A set of EPA-prescribed limit concentrations with associated treatment standards regulating disposal in landfills.

Maximum Contaminant Level (MCL): EPA-published (promulgated as law) maximum concentration level for compounds found in water in a public water supply system.

Noncarcinogenic: A type of risk resulting from the exposure to chemicals that may cause systemic human health effects.

National Contingency Plan (NCP): The basis fbr the nationwide environmental restoration program known as Superfund; administered by EPA under the direction of the U.S. Congress.

National Priorties List (NPL): EPA's list of the notion's top priority hazardous substance disposal facilities that may be eligible to receive federal money for response under CERCLA.

Presumptive Remedy: Preferred technologies for common categories of sites based on historical patterns of remedy selection and EPA's scientific and engineering evaluation of performance data on technology implementation. Presumptive remedies ensure the consistent selection of remedial actions.

RCRA Subtitle D facility: Municipal-type waste disposal facility (landfill) regulated by the Resource Conservation and Recovery Act (RCRA).

Record of Decision (ROD): A legal document that describes the remedy selected for a Superfund facility, why the remedial actions, were chosen and others not how much they are expected to cost, and how the public responded.

Reference Does (RD): An estimate (with an uncertainty spanning an order of magnitude or greater) of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime.

Remedial Action Objective (RAO): An objective selected in the FS, against which all potential remedial actions are judged.

Remedial Investigation (RI): Study that determines the nature and extent of contamination at a site.

Site Inspection (SI): Sampling investigation with the goal of identifying potential sources of contamination, types of contaminants, and potential migration of contaminants. The SI is conducted prior to the RI.

Semivolatile Organic Compounds (SVOCs): Organic chemicals [e.g., phthalates or polycyclic aromatic hydrocarbons (PAHs)) that do not readily evaporate under atmospheric conditions.

Target Compound List/Target Analyte List (TCL/TAL): List of routine organic compounds (TCL) or metals (TAL) included in the EPA Contract Laboratory Program.

Toxicity Characteristic Leaching Procedure (TCLP): Analytical test prescribed by EPA to determine potential leachate toxicity in materials; commonly used to determine the suitability of a waste for disposal in a landfill.

Trichloroethene (TCE): Common volatile organic solvent formerly used for cleaning, degreasing, or other uses in commerce and industry.

Volatile Organic Compounds (VOCs): Organic liquids [e.g., vinyl chloride or trichloroethene (TCE)] that readily evaporate under atmospheric conditions.

APPENDIX B
ATTENDANCE LIST
APRIL 24, 1997 PUBLIC MEETING

NAME	ORGANIZATION
Gregory J.Goepfert	NWS Earle
John Kolicius	Naval Facilities Engineering Command
Gus Hermanni	NWS Earle
Kevin M. Bova	NWS Earle
Deborah Sciascia	NWS Earle
Russell Turner	Brown & Root Environmental
Jeffrey Gratz	USEPA Region II
Robert Marcolina	NJDEP
Barbara Douglas	Naval Facilities Engineering Command
Thomas Wiseman	NWS Earle
Lester Jargowsky	Monmouth County Health Department
Greta Deirocini	Naval Facilities Engineering Command
Angela Mazzio	Student

ROD FACT SHEET

SITE	
Name	Naval Weapons Station Earle
Location/State	Monmouth County, New Jersey
EPA Region	II
HRS Score (date)	37 (08/30/90)
Site ID #	NJ0170022172
ROD	
Date Signed	September 25, 1997
Remedy/ies	Excavation and off-site disposal of 260 cubic yards of contaminated soil and sediment from a leach pit and drainage ditch and long-term monitoring.
Operable Unit	OU-2
Capital cost	$375,000
Construction Completion	2.5 months
O & M	$21,600
Estimated Cost	Present worth cost (based on a discount rate of 7%) - $677,000
LEAD	
Remedial/Enforcement	Federal Facility
EPA/State/PRP	Navy
Primary contact (phone)	Sharon Jaffess 212-637-4396
Secondary contact (phone)	Robert Wing 212-637-4332
Main PRP(s)	Navy
PRP Contact (phone)	John Kolicius 610-595-0567 ext. 157
WASTE	
Type (metals, PCB, etc.)	High levels of lead, chromium and cadmium in sediment and surface soil; low levels of metals in ground water
Medium (soil, g.w.,etc.)	Surface soil, sediment, and ground water
Est. quantity	260 cubic yards